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EXAMINER

KUNEMUND, ROBERT M

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/688,045
Filing Date: October 17, 2003
Appellant(s): LIN ET AL.

MAILED
FEB 23 2007
GROUP 1700

Wing Y. Mok
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 16, 2006 appealing from the Office action mailed May 11, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,451,647	Yang et al	9-2002
6,436,838	Ying et al	8-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 to 5, 8 to 10, 15, 20 to 24 and 27 to 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al (6,451,647) in view of Ying et al (6,436,838).

The Yang et al reference teaches a method of etching a MOSFET device, note entire reference. On a substrate, a high dielectric layer is deposited by standard methods such as MOCVD, note col. 5. The dielectric can be Hf, Zr, Ta or Y compounds. Then a gate layer and gate electrodes are deposited on top of the high dielectric layer. The deposition is done so that there is exposed high dielectric layer, note col. 6. The structure is then subjected to a plasma etch. The plasma etches only the high dielectric layer, note col. 6. The sole difference between the instant claims and the prior art claims is the plasma content. However, the Ying et al reference teaches the use of barium trichloride gases with other halogens to plasma etch dielectrics, note col. 3. It would have been obvious to one of ordinary skill in the art to modify the Yang et al process by the teachings of the Ying et al reference to use barium trichloride in the plasma in order to increase the selectivity of the etchant gases.

Claims 6, 7, 25 and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al (6,451,647) in view of Ying et al (6,436,838).

The Ying et al and Yang et al references are relied on for the same reasons as stated supra, and differ from the instant claims in the layer treatment. However, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to determine through routine experimentation the optimum, operable treatment of the

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dielectric layer in the Yang et al reference in order to create a uniform layer increasing the device quality.

Claims 11 to 14, 16 to 19 and 30 to 40 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al (6,451,647) in view of Ying et al (6,436,838).

The Ying et al and Yang et al references are relied on for the same reasons as stated supra, and differ from the instant claims in the plasma conditions. However, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to determine through routine experimentation the optimum, operable plasma conditions in the Yang et al reference in order to selectively etch the high dielectric layer and not the gate.

(10) Response to Argument

The combination of the Yang et al and Ying et al references teach the instantly claimed invention. The combination teaches etching of a high dielectric material by a plasma containing inert gas, boron trichloride, and a fluorocarbon gas. Both references do etching the same materials by the use of a plasma.

Appellants' argument concerning the Ying et al reference is noted. However, as stated, in the rejections the examiner readily admits that standing alone the Ying et al reference does not teach the every limitation of the claims. The Ying et al reference does not teach the use of a fluorocarbon in the etching plasma. It does however, teach the remaining limitations of claim 1. The reference does teach a dielectric material on a substrate, gate and electrode on the dielectric, with exposed portions of the dielectric

layer. The reference teaches plasma etching the dielectric with a plasma containing the claimed gases except for the fluorocarbon.

Appellants' argument concerning the Yang et al reference has been considered and not deemed persuasive. The Yang et al reference teaches etching dielectric materials, the same as Ying et al. Note, overlapping materials in the tables. The Yang et al reference teaches that the gas in the plasma is a fluorocarbon gas. The plasma etches the dielectric. Again, the examiner admits that the Yang et al reference does not teach all limitations of claim 1. The reference does not teach all gases of the plasma. But it does teach that fluorocarbon gases in plasma will etch dielectric materials.

Appellants' argument concerning the combination of references is noted. However, it is well settled that if two references teach the individual components that do the similar function, combining the two together would have been well within the level and skill of one of ordinary skill, note, MPEP 2144.06. Thus, it is obvious to one of ordinary skill in the art to combine the gases to etch as claimed. The examiner has supplied sufficient reasoning to combine the references and arrive at the claimed invention. Clearly, the combination of Ying et al and Yang et al meets the entire claim 1. The combination of references in view of the citation, has a plasma gas with inert gases, barium trichloride and fluorocarbon gas etching dielectrics. Therefore, the examiner has followed the case law and MPEP citations of appellants in making a proper rejection and combination of references.

Appellants' argument concerning the teaching of no chlorine in the Ying et al reference has been considered and not deemed persuasive. The Yang et al reference

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does not teach one cannot use chlorine gas in the plasma. So there is no teaching away as argued by appellant. The reference teaches the use of fluorocarbon as a different gas for the etching of dielectric. There is no teaching not to use chlorine.

Appellants' argument concerning no suggestion or evidence to combine is noted. However, the examiner has provide a reasoning to combine the references. Also, it is well settled that one can rely on case law to combine references, as is done in the case. Therefore, the examiner has made a proper rejection.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Appellants' argument concerning the remaining claims has been considered and not deemed persuasive. The argument is based that since claim 1 is not meet by the combination, the remaining claims are allowable for the same reasons. However, it is the examiner's position that since the rejection of claim 1 is proper the remaining claims are properly rejected. Again, appellants merely argue that each reference separately does not teach all limitations.

(11) Related Proceeding(s) Appendix

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No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

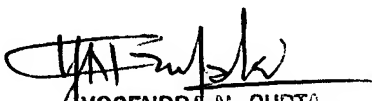
Respectfully submitted,

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